

3D: Comparing and Contrasting Two- and Three- Dimensional Geometric Shapes

Brief Overview:

Students will use their prior knowledge of two- dimensional shapes to discover the similarities and differences between two and three-dimensional figures. Students will apply this knowledge to create three-dimensional geometric shape nets as well as a concrete model of the shape itself.

NCTM Content Standard/National Science Education Standard:

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments and geometric relationships.

Grade/Level:

Grade 4 or Grade 5

Duration/Length:

60 – 70 minutes per lesson

3 lessons

Student Outcomes:

Students will:

- Identify, discuss and explain the similarities and differences between two- and three- dimensional geometric shapes
- Create nets for three-dimensional geometric shapes (cube, rectangular prism, triangular prism, triangular pyramid, rectangular pyramid)
- Use nets to construct concrete models for three-dimensional geometric shapes (cube, rectangular prism, triangular prism, triangular pyramid, rectangular pyramid)

- Use everyday items to construct concrete models for three-dimensional geometric shapes (cube, rectangular prism, triangular prism, triangular pyramid, rectangular pyramid)

Materials and Resources:

Day One

- Student Resource 1-3D What Can You Tell about Me?
- Teacher Resource 1-3D What Can You Tell about Me?
Answer key
- 1 Geoboard for each student
- 1 overhead Geoboard for the teacher
- Student Resource 2-3D Square/Cube Venn Diagram
- 1 overhead, poster or chart of Student Resource 2-3D Square/Cube Venn Diagram
- Teacher Resource 2-3D Square/Cube Venn Diagram answer key
- Student Resource 3-3D Rectangle/Rectangular Prism Venn Diagram
- 1 overhead, poster or chart of Student Resource 3-3D Rectangle/Rectangular Prism Venn Diagram
- Teacher Resource 3-3D Rectangle/Rectangular Prism Venn Diagram answer key
- Student Resource 4-3D Triangle/ Triangular Prism Venn Diagram
- 1 overhead, poster or chart of Student Resource 4-3D Triangle/ Triangular Prism Venn Diagram
- Teacher Resource 4-3D Triangle/ Triangular Prism Venn Diagram answer key
- Student Resource 5-3D Triangle/ Triangular Pyramid Venn Diagram
- 1 overhead, poster or chart of Student Resource 5-3D Triangle/ Triangular Pyramid Venn Diagram
- Teacher Resource 5-3D Triangle/ Triangular Pyramid Venn Diagram answer key
- Student Resource 6-3D Rectangle/Rectangular Pyramid Venn Diagram

- 1 overhead, poster or chart of Student Resource 6-3D Rectangle/Rectangular Pyramid Venn Diagram
- Teacher Resource 6-3D Rectangle/Rectangular Pyramid Venn Diagram answer key
- 1 basket per group containing: 1 cube, 1 rectangular prism, 1 triangular prism, 1 triangular pyramid, 1 rectangular pyramid, 1 construction paper square, 1 construction paper rectangle, 1 construction paper triangle

Extension Materials: Student Resource 7-3D Riddles, Teacher Resource 7-3D Riddles answer key

Reteaching Materials: real life models of shapes that can be into parts (suggested examples triangular prism: Toblerone candy box, cube: tissue box, rectangular prism: cereal box)

Day 2

- Each group of five students needs 6 congruent construction paper squares for the cube; 6 congruent construction paper rectangles for the rectangular prism; 2 congruent construction paper triangles and 3 congruent construction paper rectangles for the triangular prism; 4 congruent construction paper triangles for the triangular pyramid; 1 congruent construction paper square and 4 congruent construction paper triangles for the rectangular pyramid
- Circle sticker dots
- pieces of large chart paper
- Glue for each group of students
- Student Resource 8-3D Net Pre-Assessment
- Teacher Resource 8-3D Net Pre-Assessment answer key
- Student Resource 9-3D Cube Net
- Student Resource 10-3D Rectangular Prism Net
- Student Resource 11-3D Triangular Prism Net
- Student Resource 12-3D Triangular Pyramid Net
- Student Resource 13-3D Rectangular Pyramid Net
- Student Resource 14-3D Table for Three-Dimensional

Figures

- 1 overhead, poster or chart of Student Resource 14-3D Table for Three-Dimensional Figures

- Teacher Resource 9-3D is the answer key for Student Resource 14-3D Table for Three-Dimensional Figures
- Student Resource 15-3D Riddle BCR
- Teacher Resource 10-3D Riddle BCR answer key
- Extension Resource: pattern blocks
- Reteaching Resource: crayons or color pencils

Day 3

- Computer Lab or 1 computer and LCD projector
- Vertex Material Options: clay, mini marshmallows, gumdrops
- Edge Material Options: pretzel sticks, toothpicks, straws, coffee stirrers
- Class generated Table for Three-Dimensional Figures overhead/poster/chart from Day 2
- Post-it Notes big enough to cover each answer on class Table for Three-Dimensional Figures overhead/poster/chart from Day 2
- Student Resource 16-3D Day 3 Pre-assessment
- Teacher Resource 11-3D Day 3 Pre-assessment answer key
- Student Resource 17-3D What 3-Dimensional Geometric Shape Can You Make With...BCR
- Teacher Resource 12-3D What 3-Dimensional Geometric Shape Can You Make With...BCR answer key
- Reteach: Student Resource 18-3D Pictorial Flow-chart of Three-Dimensional Geometric Shapes

Development/Procedures:

Lesson 1

Pre-Assessment

Students complete Student Resource 1-3D What Can You Tell about Me? Answers can be found on Teacher Resource 1.

Launch

- Give each student a Geoboard and several rubber bands.
- Name a polygon (rectangle, triangle, pentagon, hexagon, trapezoid, octagon, rhombus, parallelogram, square...) and have

students create as many different versions of that polygon as they can on their Geoboard in approximately 2 minutes.

- Have students hold up their Geoboard so they can see the shapes that each person created.
- Invite a volunteer to share his/her creation with the class on the overhead Geoboard.
- Repeat the process naming a different polygon.
- Use the square polygon last so as to ease the transition into the teacher facilitation section

Teacher Facilitation

Post the following question and state it orally to the class as the guiding question for today's lesson.

"How are two- and three- dimensional shapes alike and different?"

Distribute Student Resource 2-3D Square/Cube Venn Diagram to each student. This will be used for students to record the class generated responses that you will be recording on the overhead, poster or chart of Student Resource 2-3D Square/Cube Venn Diagram.

With the square still showing on the overhead Geoboard, hold up a cube and ask the students, "How are these two things alike?" "How are these two things different?"

As you generate student responses, record their responses on the overhead copy of Student Resource 2-3D Square/Cube Venn Diagram while students record the answers on their copy. The teacher should incorporate key vocabulary into the discussion when the teaching moment occurs. (faces, edges, vertices, angles, length, width, height, correct names of polygons and polyhedrons) See Teacher Resource 2 for expected responses.

Distribute one basket per group containing: 1 cube, 1 rectangular prism, 1 triangular prism, 1 triangular pyramid, 1 rectangular pyramid, 1 construction paper square, 1 construction paper rectangle, 1 construction paper triangle.

Distribute Student Resource 3-3D Rectangle/Rectangular Prism Venn Diagram to each student.

Student Application

Student groups will use the physical models in their baskets to help foster their discussion of the similarities and differences between the rectangle and the rectangular prism. Students will record their group ideas on their Venn diagram (Student Resource 3-3D). See answer key on Teacher Resource 3.

As the students work, circulate around the room to assess the students' progress and knowledge.

After groups have completed their Venn diagrams, have them share their ideas with the class as you record their responses on the overhead, poster or chart of Student Resource 3-3D Rectangle/Rectangular Prism Venn Diagram. The teacher should incorporate key vocabulary into the discussion when the teaching moment occurs.

Distribute Student Resource 4-3D Triangle/ Triangular Prism Venn Diagram to each student.

Student groups will use the physical models in their baskets to help foster their discussion of the similarities and differences between the triangle and the triangular prism. Students will record their group ideas on their Venn diagram (Student Resource 4-3D).

As the students work, circulate around the room to assess the students' progress and knowledge.

After groups have completed their Venn diagrams, have them share their ideas with the class as you record their responses on the overhead, poster or chart of Student Resource 4-3D Triangle/ Triangular Prism Venn Diagram. The teacher should

incorporate key vocabulary into the discussion when the teaching moment occurs. See Teacher Resource 4 for correct responses.

Distribute Student Resource 5-3D Triangle/ Triangular Pyramid Venn Diagram to each student.

Student groups will use the physical models in their baskets to help foster their discussion of the similarities and differences between the triangle and the triangular pyramid. Students will record their group ideas on their Venn diagram (Student Resource 5-3D).

As the students work, circulate around the room to assess the students' progress and knowledge.

After groups have completed their Venn diagrams, have them share their ideas with the class as you record their responses on the overhead, poster or chart of Student Resource 5-3D Triangle/ Triangular Pyramid Venn Diagram. The teacher should incorporate key vocabulary into the discussion when the teaching moment occurs. See Answer Key on Teacher Resource 5.

Distribute Student Resource 6-3D Rectangle/Rectangular Pyramid Venn Diagram to each student

Student groups will use the physical models in their baskets to help foster their discussion of the similarities and differences between the rectangle and the rectangular pyramid. Students will record their group ideas on their Venn diagram (Student Resource 6-3D).

As the students work, circulate around the room to assess the students' progress and knowledge.

After groups have completed their Venn diagrams, have them share their ideas with the class as you record their responses on the overhead, poster or chart of Student Resource 6-3D Rectangle/ Rectangular Pyramid Venn Diagram. Incorporate key

vocabulary into the discussion when the teaching moment occurs.
See answer key on Teacher Resource 6.

Have students reflect on what they learned in today's lesson by completing a journal response that answers the lesson's guiding question, "How are two- and three- dimensional shapes alike and different?"

Embedded Assessment

Analysis of student pre-assessment responses (Student Resource 1-3D What Can You Tell about Me?)

Teacher observation of group discussions and shared student responses.

Student Journal response to the guiding question, "How are two- and three- dimensional shapes alike and different?"

Reteaching

Use real world objects for each shape that the students can cut apart (suggested examples triangular prism: Toblerone candy box, cube: tissue box, rectangular prism: cereal box...). Have the students cut the 3-dimensional geometric shape into its 2-dimensional parts. Discuss with the students how the 2-dimensional shapes make up the 3-dimensional geometric shapes. Lead the discussion to help the student recognize the similarities and differences between the 2-dimensional and 3-dimensional geometric shapes.

Extension:

Students complete Student Resource 7-3D Riddles. See Teacher Resource 7 for the Answer key.

Lesson 2

Pre-Assessment

Students complete Net Pre-Assessment Day 2 SR8-3D. Answer key can be found on Teacher Resource 8.

Launch

Distribute the following to each group of five students: 6 congruent construction paper squares for the cube; 6 congruent construction paper rectangles for the rectangular prism; 2 congruent construction paper triangles and 3 congruent construction paper rectangles for the triangular prism; 4 congruent construction paper triangles for the triangular pyramid 1 construction paper square and 4 congruent construction paper triangles for the rectangular pyramid and circle sticker dots.

Each student in the group should be constructing a different 3-dimensional shape.

Students use the construction paper two-dimensional shapes and the circle sticker dots to construct the appropriate three-dimensional shape.

As the students work, circulate around the room to assess the students' progress and knowledge that serves as a quick assessment.

When the students are finished, ask, "Who has a cube?" and the students with that shape can hold it up. Continue in this manner with all shapes.

Teacher Facilitation

Have each student disconnect some of the circle sticker dots in order to lay the shape flat to create a net.

Put glue on the net and then place a piece of paper on the net and rub in order to stick the net to the paper.

Display big chart paper for each three-dimensional shape around the room.

Have students attach their nets to large chart paper according to what three-dimensional shape it forms.

Discuss the similarities and differences between the nets for each shape. Questions may include:

Do all the nets for a cube look the same?

Why are there different nets for the shape?

Do all the nets form a cube?

Are there other nets that would form a cube that we are missing?

Repeat this questioning pattern for the other three-dimensional shapes

Student Application

Distribute the nets to each student. (Student Resource 9-Student Resource 13)

Students should cut out each net and use circle dot stickers or tape to construct.

As the students work, circulate around the room to assess the students' progress and knowledge which serves as a quick assessment

When the students are finished, use the chart or transparency of Student Resource 14-3D Three-Dimensional Figures to complete together as a class. Keep this for Day 3. Answer key can be found on Teacher Resource 9.

Have children complete their own copy of Student Resource 14-3D Three- Dimensional Figures as you work through it together on the chart or transparency.

You may want to have the children touch the vertices as you complete the vertices part of the chart to make sure they comprehend. Continue in this manner. This will reinforce the key vocabulary terms.

Discuss the similarities and difference between the shapes and between the vertices, edges, and faces.

Distribute Student Resource 15-3D (Riddle BCR) for students to complete. Answer key can be found on Teacher Resource 10.

Embedded Assessment

Analyze the students' responses during the launch when asked to hold up different shapes.

Teacher observation of the creation of the nets

Analyze the class discussion of the similarities and difference of the three-dimensional shapes as class completes Student Resource 14-3D Three-Dimensional Figures.

Student Resource 15-3D Riddle BCR

Reteaching

Some students may benefit from coloring or numbering the faces prior to cutting out the nets. This will ease the counting of faces while completing Student Resource 14-3D Three-Dimensional Figures.

It may also help to have cereal boxes, etc. cut apart so the children can manipulate them as they create their own nets.

Extension

Use pattern blocks to show the two-dimensional shapes that would be used to create the three-dimensional shape. Configure the pattern blocks in the shape of what the net would look like.

Lesson 3

Pre-Assessment

Students should complete Day 3 Pre-Assessment Student Resource 16-3D. Answer key can be found on Teacher Resource 11.

Launch

Use the Virtual Manipulative website to allow children to display, rotate, and resize three-dimensional geometric shapes. It also

allows students to select and count vertices, edges, and faces to see the connection between the three. Directions for using this virtual manipulative tool are located on the site.

http://nlvm.usu.edu/en/nav/frames_asid_128_g_2_t_3.html?open=instructions

Teacher Facilitation

Cover chart or transparency of Student Resource 14-3D Three Dimensional Figures with Post-it notes.

Distribute the teacher selected vertex and edge materials to all students.

Discuss with class how many vertex materials would be needed to construct one cube. Then discuss how many edge materials would be needed to construct one cube.

Remove Post-its from Student Resource 14-3D Three-Dimensional Figures as each correct answer is revealed.

Demonstrate step-by-step how to construct the cube using the materials. Students should repeat your procedures after each step to construct a cube of their own.

Student Application

Each group should now discuss how many vertex materials they will need to construct a rectangular prism. Share small group ideas with entire class. Uncover the appropriate space on Student Resource 14-3D Three Dimensional Figures to reveal the answer.

Each group should now discuss how many edge materials they will need to construct a rectangular prism. Share small group ideas with entire class. Uncover the appropriate space on Student Resource 14-3D Three Dimensional Figures to reveal the answer.

Each student will construct a rectangular prism using the materials given.

Each group should now discuss how many vertex materials they will need to construct a triangular prism. Share small group ideas with entire class. Uncover the appropriate space on Student Resource 14-3D Three Dimensional Figures to reveal the answer.

Each group should now discuss how many edge materials they will need to construct a triangular prism. Share small group ideas with entire class. Uncover the appropriate space on Student Resource 14-3D Three Dimensional Figures to reveal the answer.

Each student will construct a triangular prism using the materials given.

Continue in this manner for the rectangular pyramid and triangular pyramid.

Students will complete Student Resource 17-3D "What 3-Dimensional Geometric Shape can you make with...?"
Answer key can be found on Teacher Resource 12.

Or

Students will complete another copy of Student Resource 1-3D What Can You tell About Me? Compare the student response on this assessment to the students' responses on the pre-assessment at the beginning of the unit and evaluate the growth in the students' knowledge about the three-dimensional geometric shapes.

Embedded Assessment

Analysis of answers from pre-assessment.

Observe the students as they interact with the website.

Information gathered during the class discussion on the number of items needed prior to constructing the shape.

Observe if the three-dimensional shapes are constructed accurately.

Reteaching

Have the three-dimensional solids available for students to use as concrete models as they construct their own versions.

Have the three-dimensional solid nets available for students to access and use as they construct their own version.

Have Pictorial Flow-Chart of Three-Dimensional Geometric Shapes available for visual students. (Student Resource 18-3D)

Extension

If using edible materials, have materials set overnight to harden. Dip three-dimensional shapes into bubble solution. Students pop faces as they count them.

Bubble solution recipe:

Gently mix $\frac{1}{2}$ cup (500 mL) liquid dishwater detergent, 4 $\frac{1}{2}$ cups (4.5 L) water, and 4 tablespoons glycerin* (60 mL) in container.

Foam may be skimmed from the top before use.

* Glycerin may be purchased from a pharmacy or from a farm or animal supply store.

Use Student Resource 14-3D Three Dimensional Figures to generate a formula for the relationship between the number of faces, edges, and vertices. The chart is set up so that the number of edges minus the number of faces equals x . Then the number of vertices minus x equals two. Your students may come up with other equations.

Summative Assessment:

Students will complete another copy of Student Resource 1-3D What Can You tell About Me? Compare the student response on

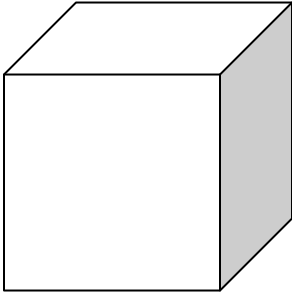
this assessment to the students' responses on this assessment when it was given as the pre-assessment at the beginning of the unit and evaluate the growth in the students' knowledge about the three-dimensional geometric shapes.

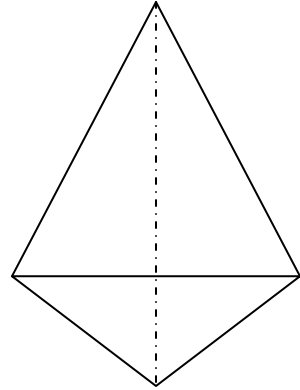
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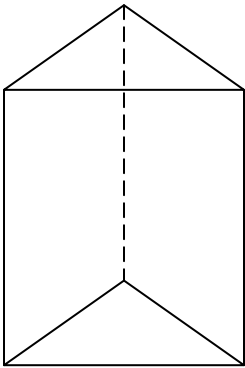
**Miki Fitzgerald
Central Office
Carroll County, MD**

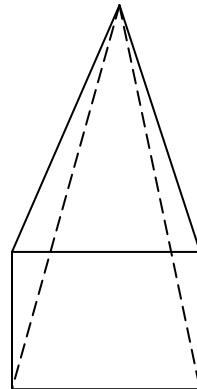
**Ann Moxley
Manchester Elementary School
Carroll County, MD**

What Can You Tell About
Me?





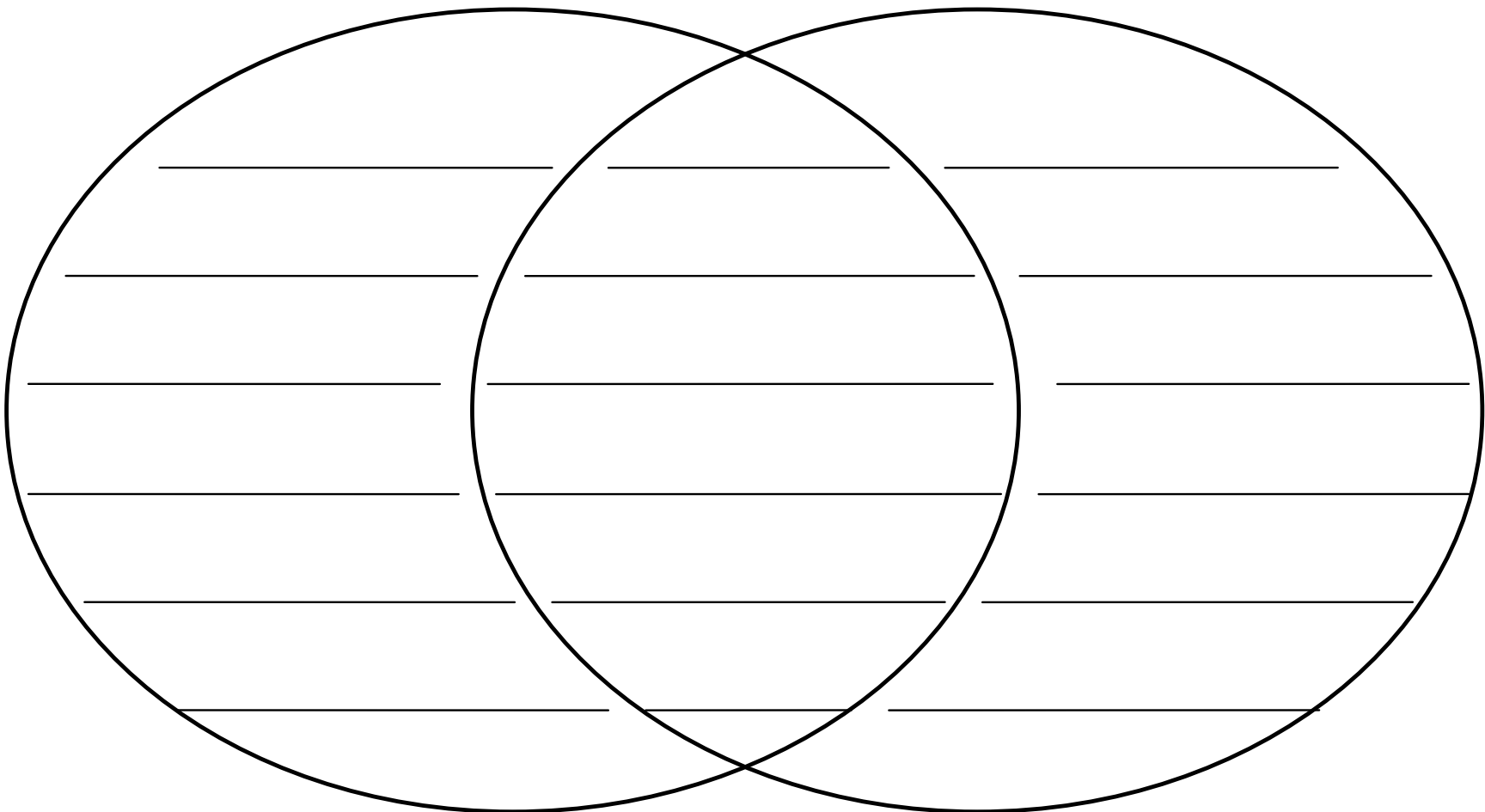
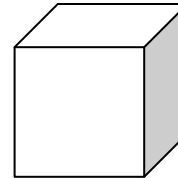
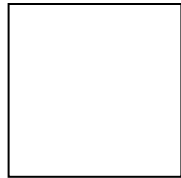




Student Resource 2

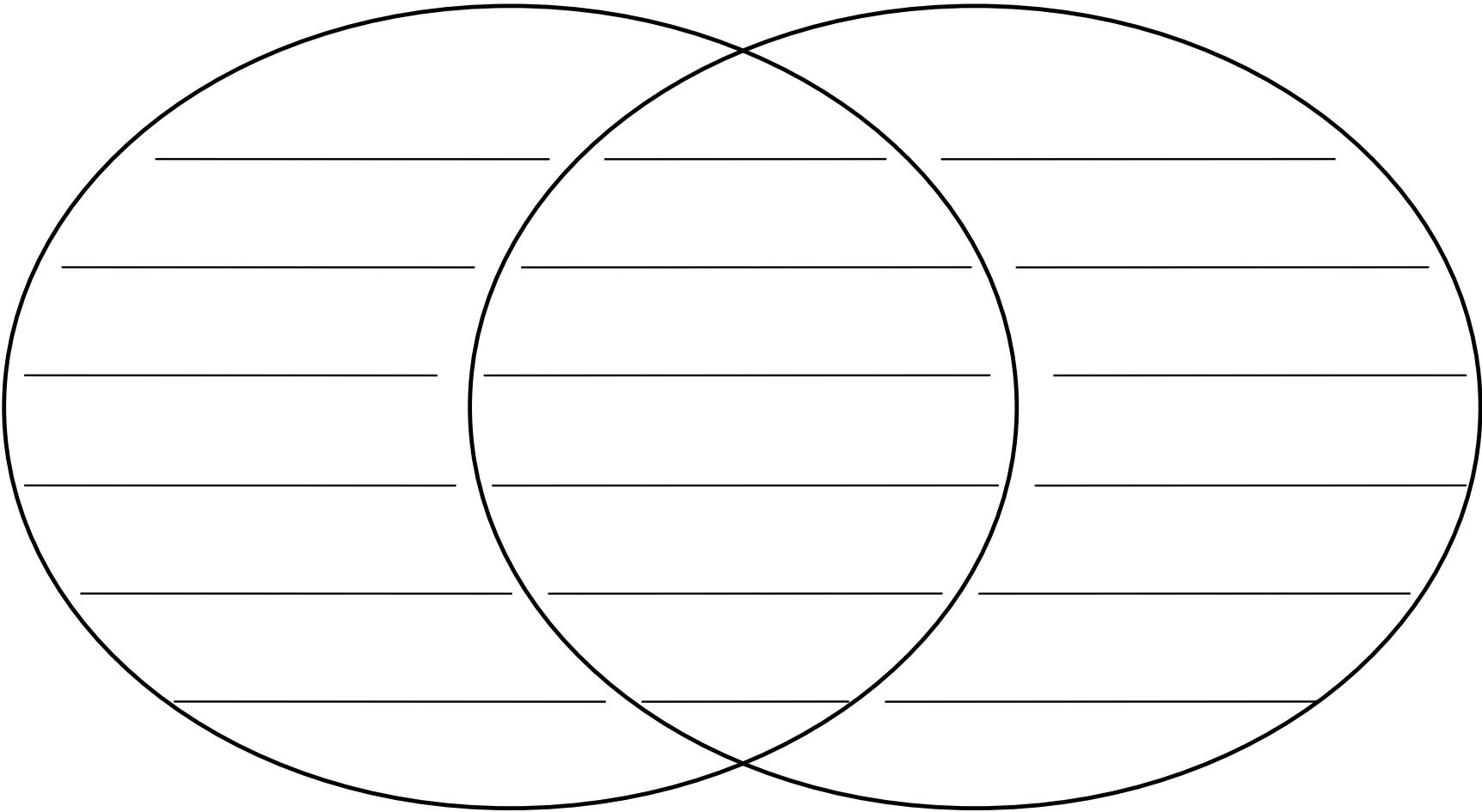
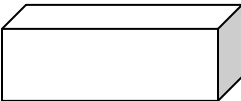
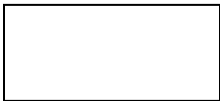
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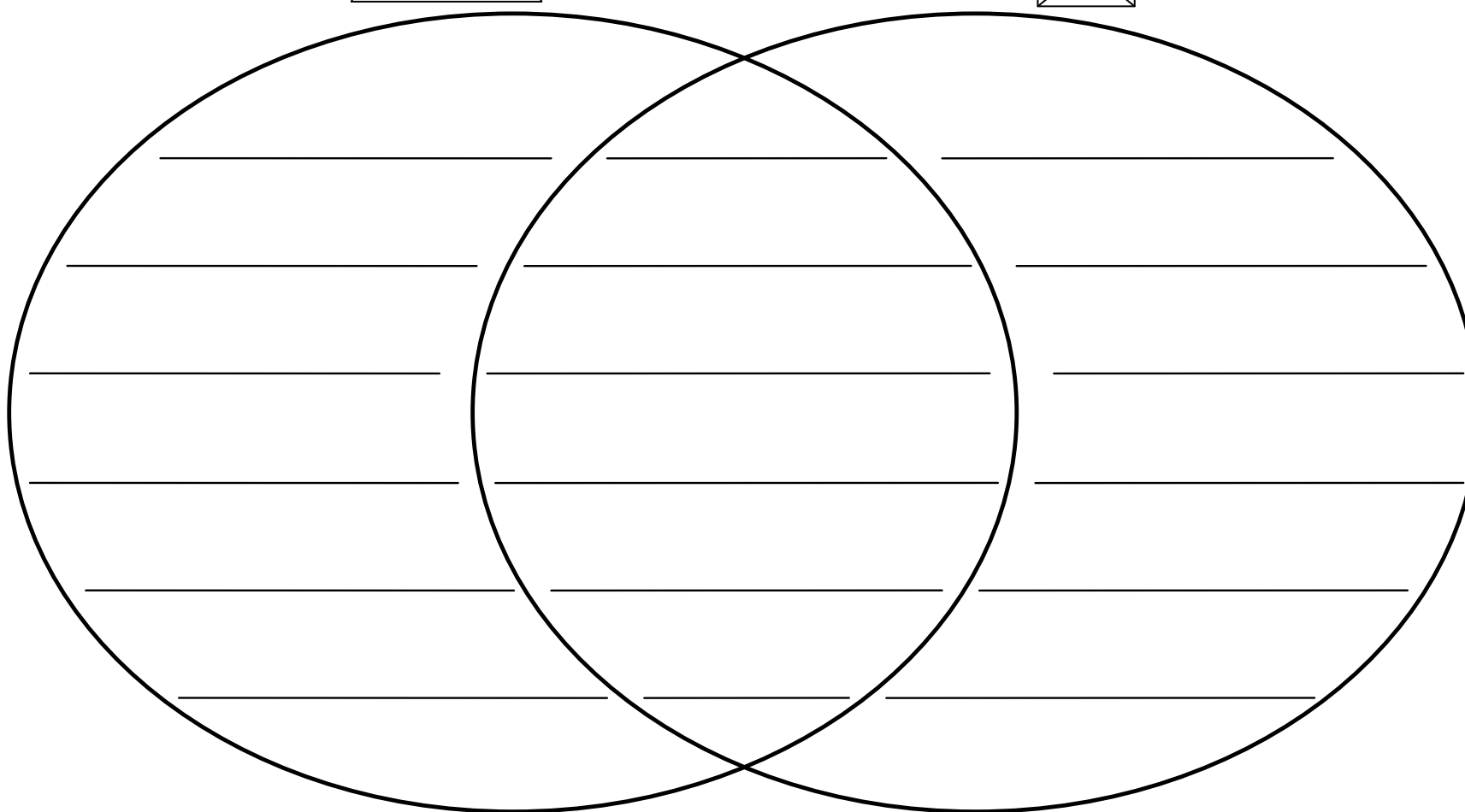
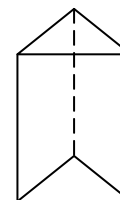
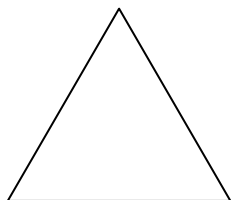
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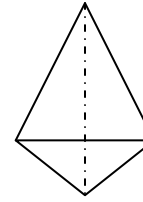
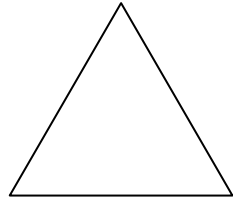
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A Venn diagram with two overlapping circles. Each circle contains five horizontal lines for writing. The intersection of the two circles also contains five horizontal lines.

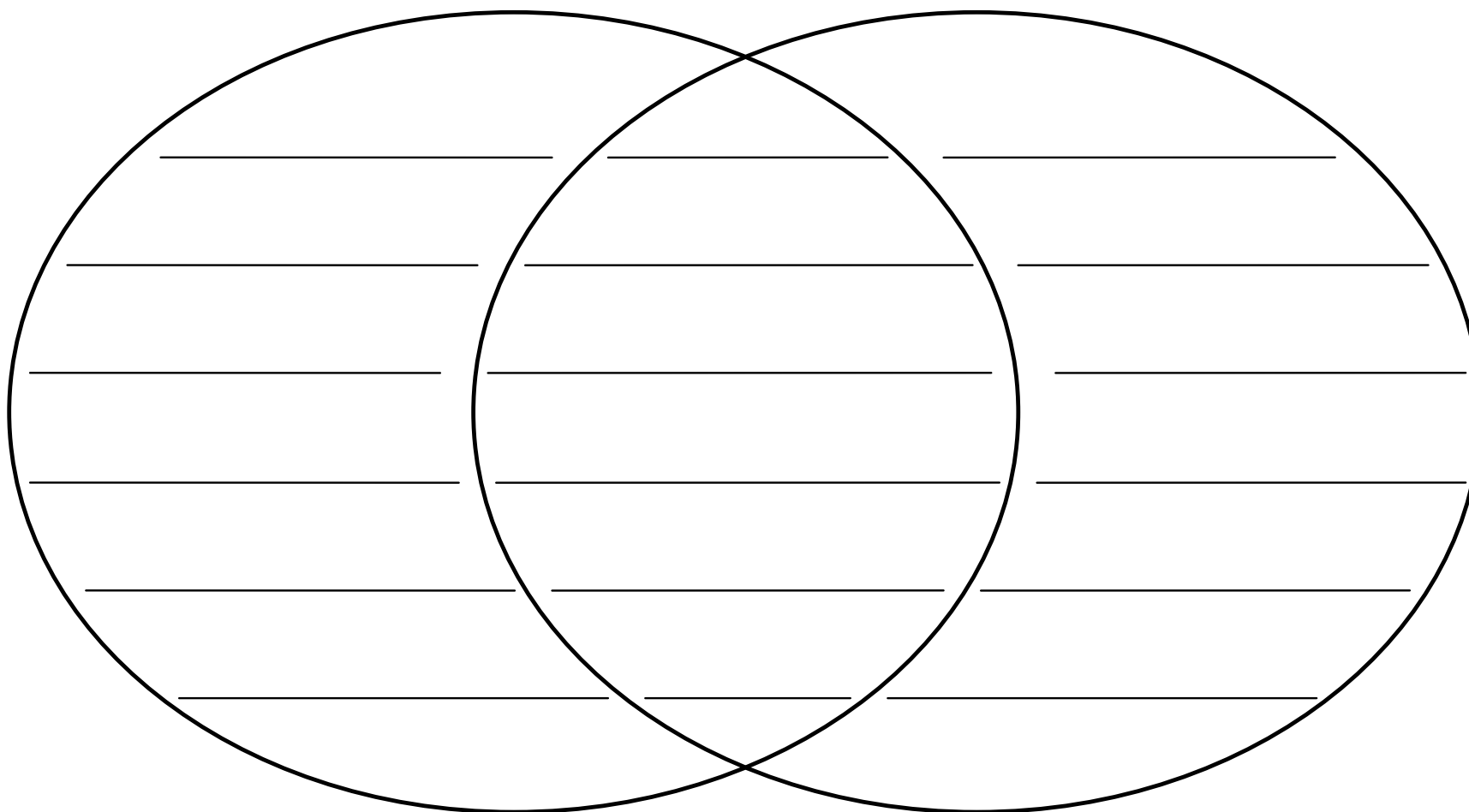
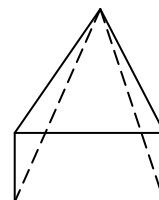
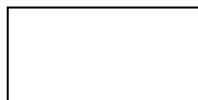
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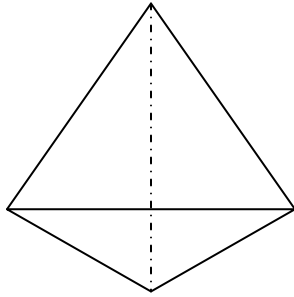
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A Venn diagram consisting of two large, overlapping circles. Each circle is divided into three horizontal sections by four horizontal lines. The left circle has five lines, the right circle has five lines, and the overlapping area in the center also has five lines. This structure is designed for students to write characteristics or properties of the shapes represented by the triangle and pyramid above.

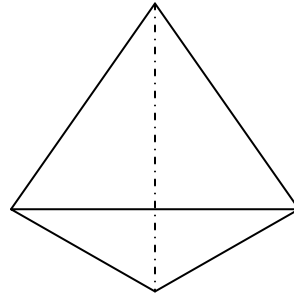
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Riddles



Use your knowledge of geometry to identify these figures.

- 1. I have four sides.
All my sides are the same length.
I have four right angles.
What am I? _____**

- 2. I have six faces.
My faces meet at right angles.
All my faces are squares.
What am I? _____**

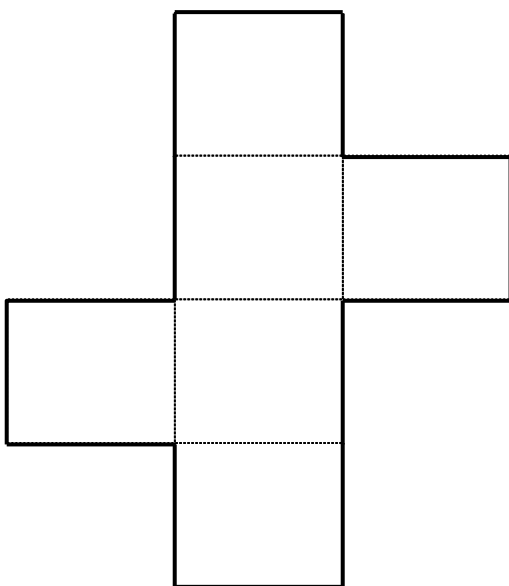
- 3. I have five faces.
All but one of my faces is a triangle
The face of the base has two pairs of parallel sides and
four right angles.
What am I? _____**

- 4. I have five faces.
My base shape has three sides.
I am constructed with three rectangles.
What am I? _____**

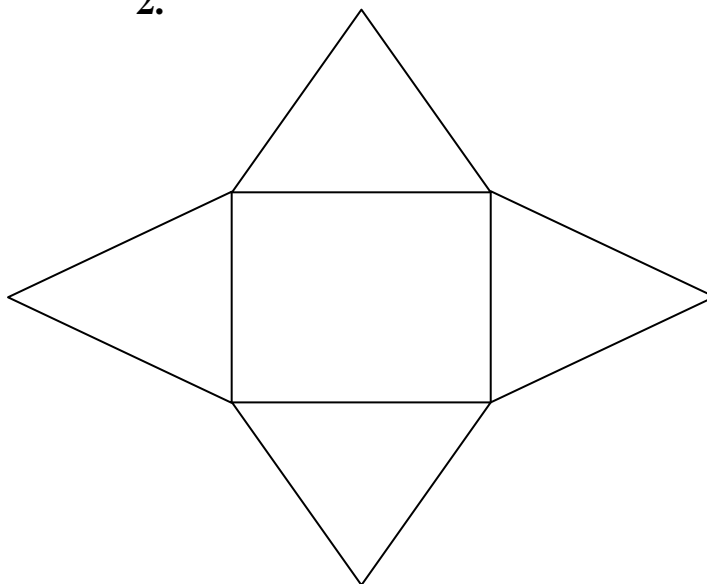
Net Pre-Assessment Day 2

Directions: Use the following nets to name the figure.

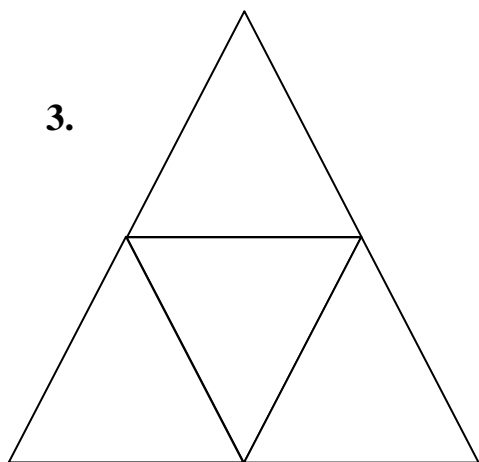
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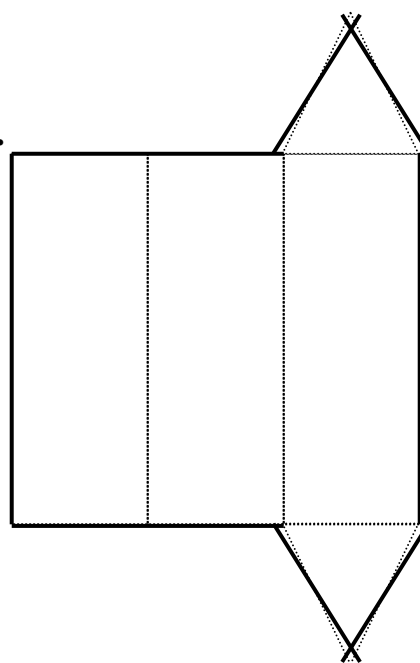
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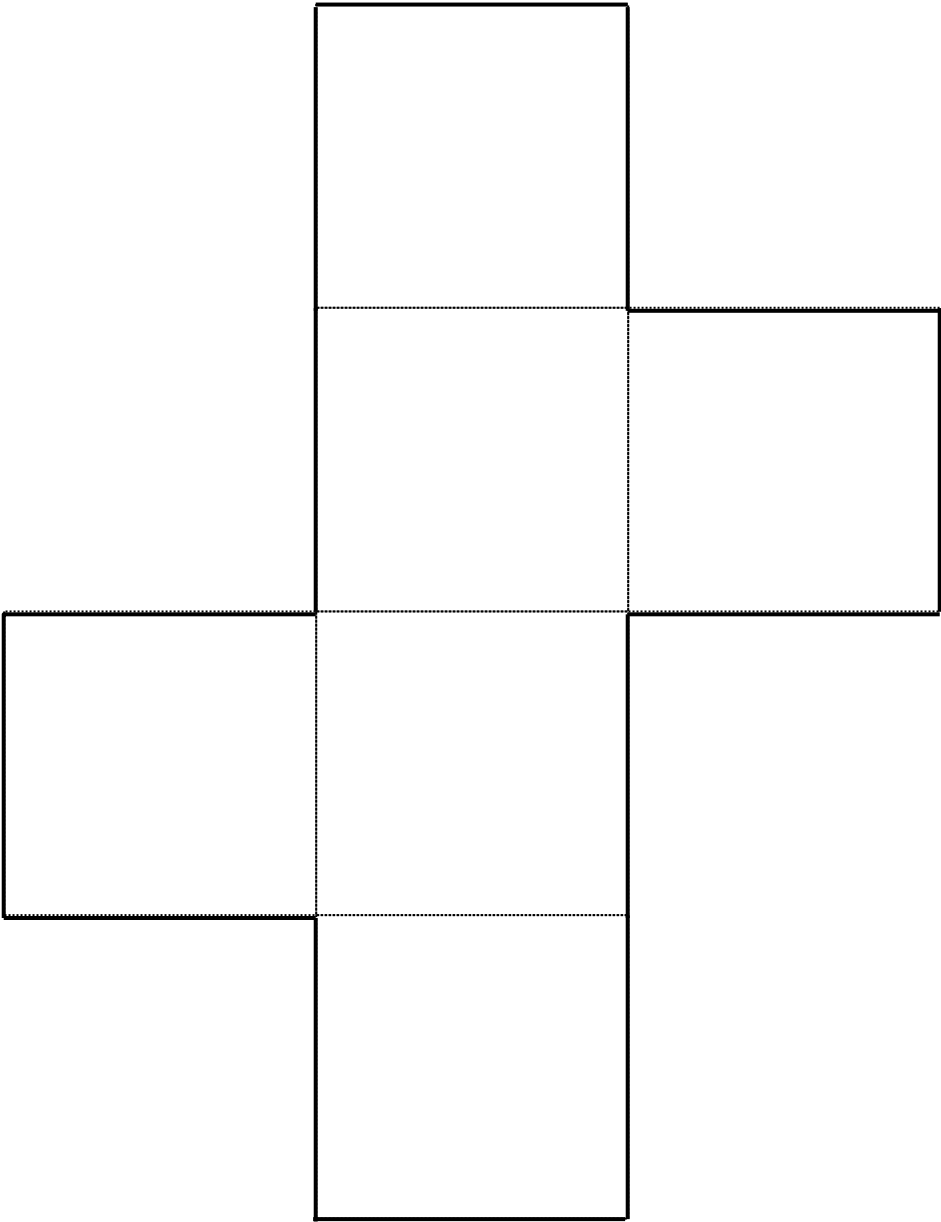
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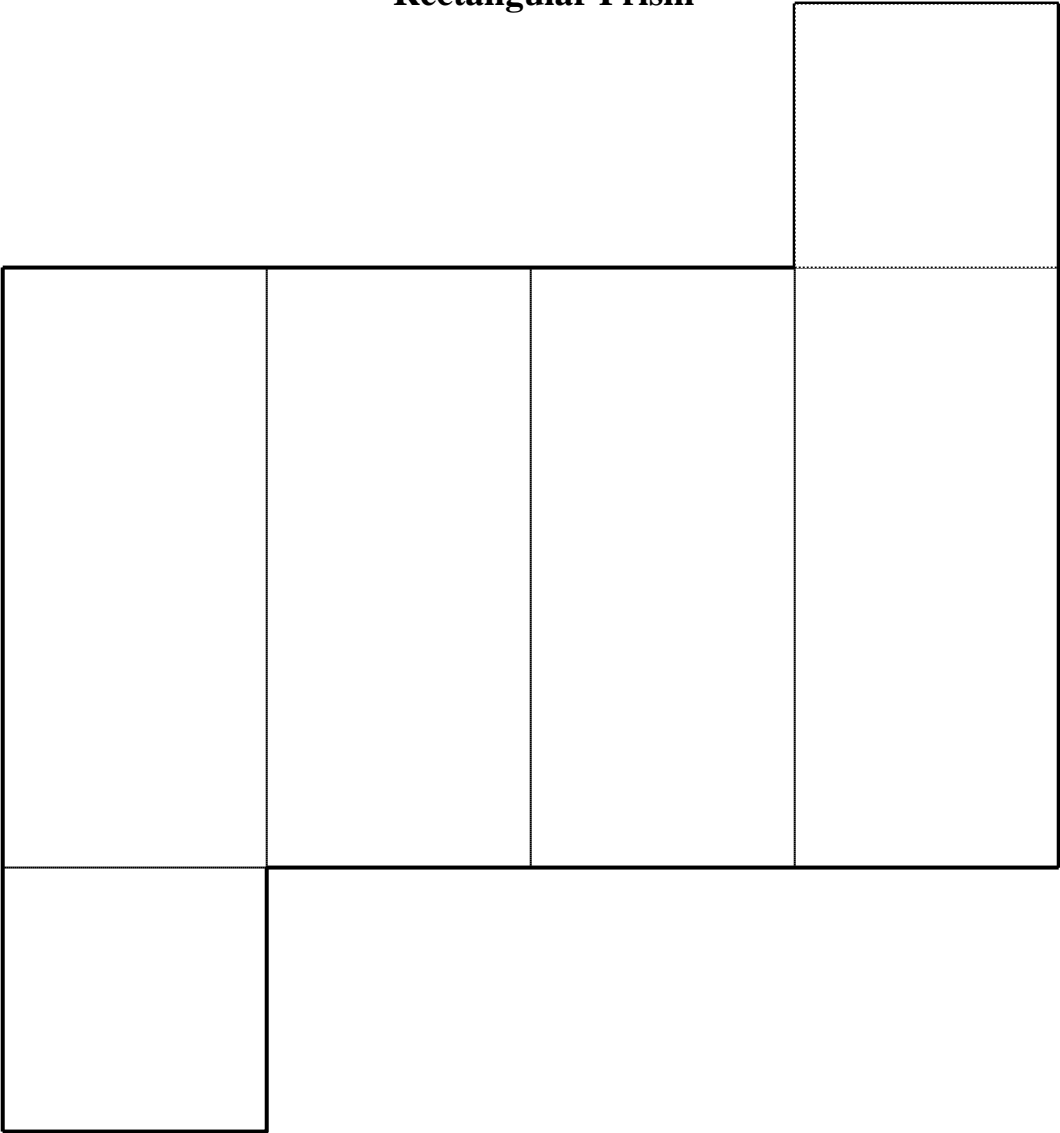
4.



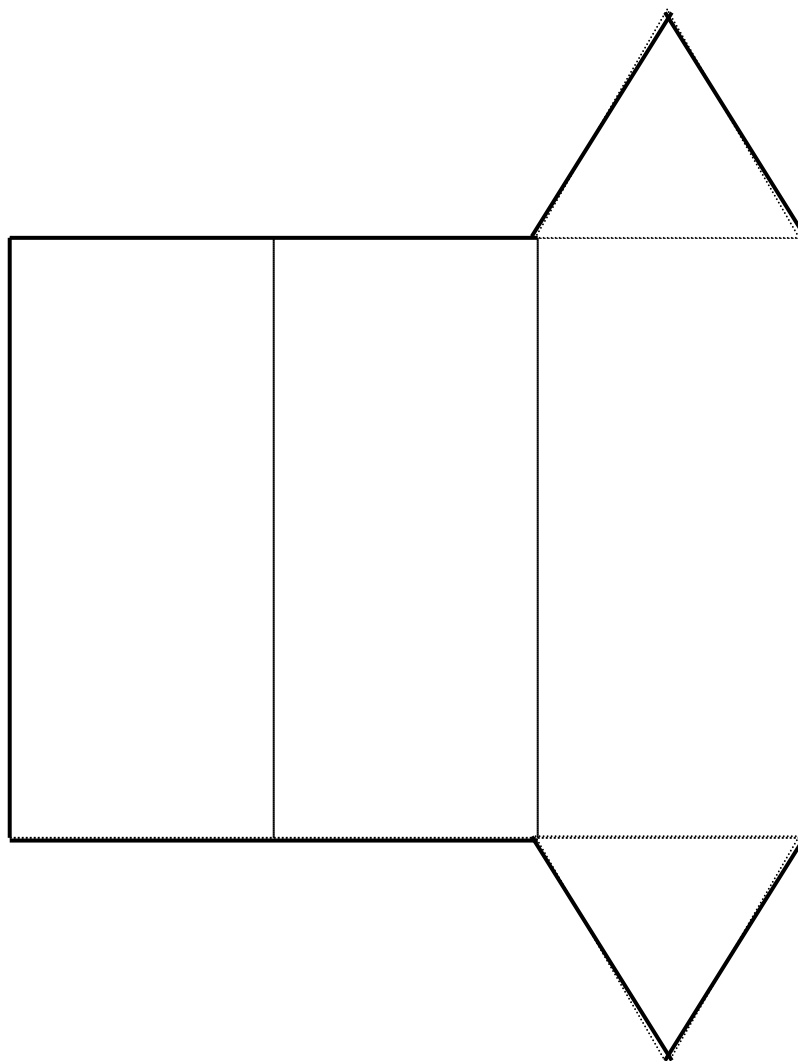
Cube Net



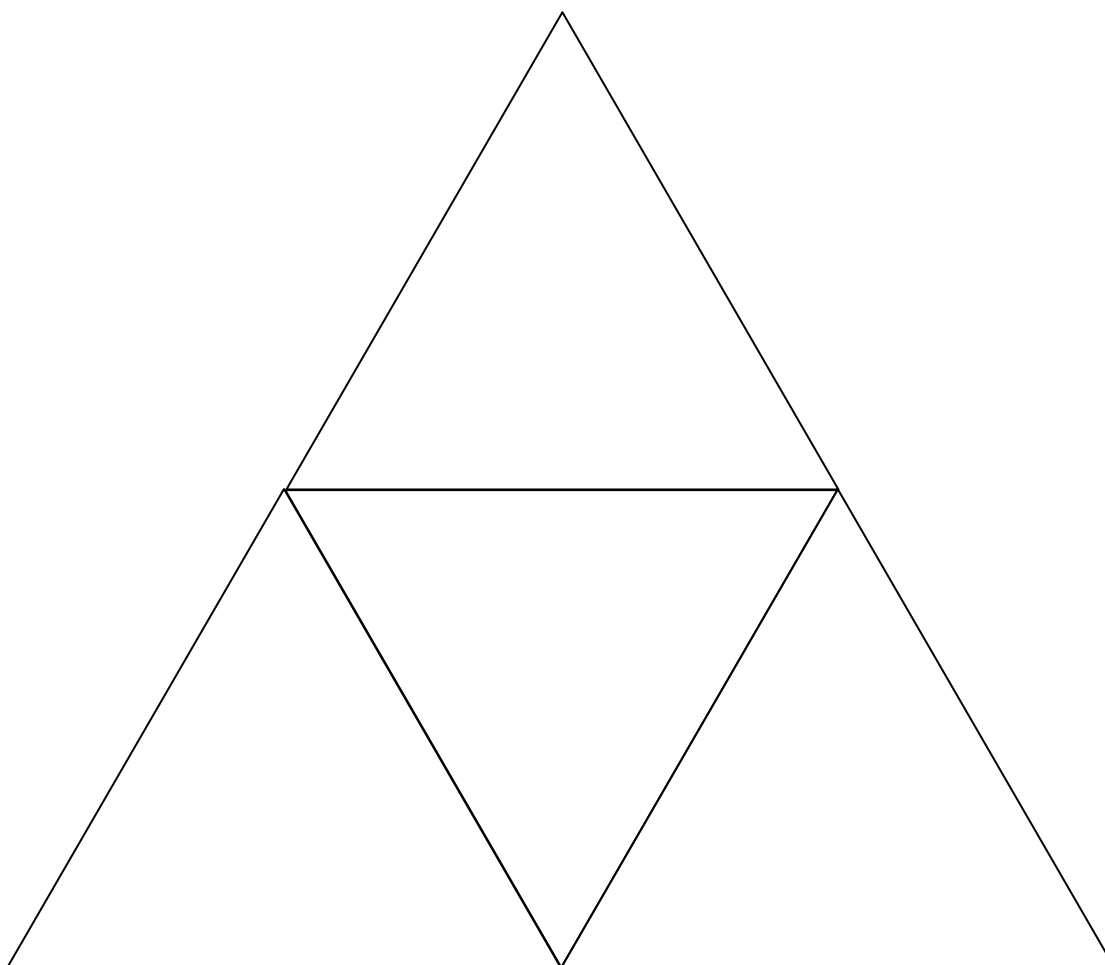
Rectangular Prism



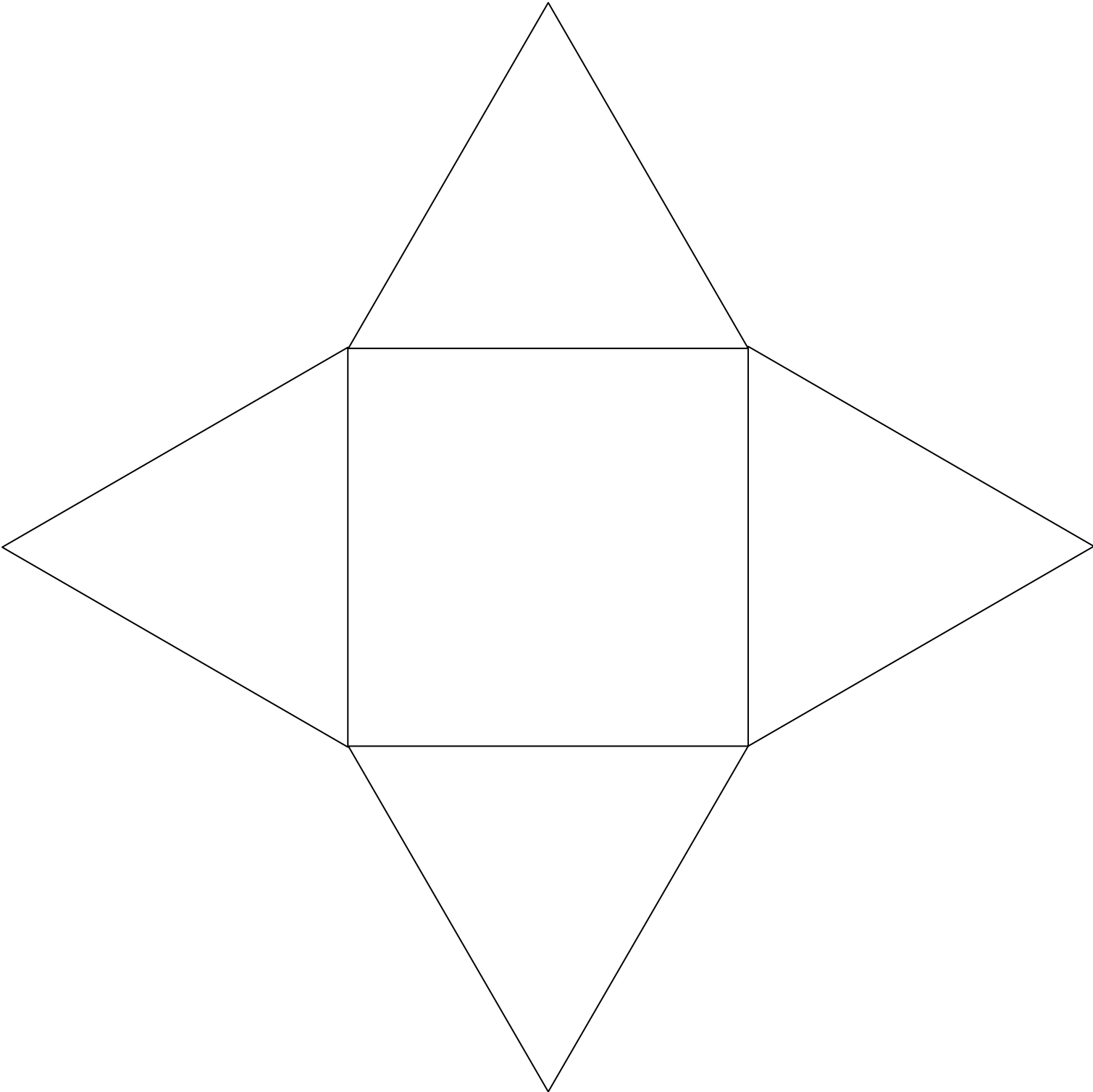
Triangular Prism



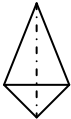
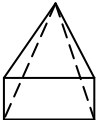
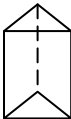
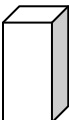
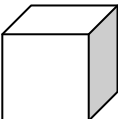
Triangular Pyramid Net



Rectangular Pyramid Net



Three Dimensional Figures

Picture	Name	Number of Edges	Number of Faces	Number of Vertices	Real World Examples
	Triangular pyramid				
	Rectangular pyramid				
	Triangular prism				
	Rectangular prism				
	Cube				

Riddle BCR

Part A

A shape has four faces. All the faces are the same shape. There are only triangular shaped faces. To put it together you tape six edges. Name this 3-dimensional shape.

Part B

Use what you know about geometric figures to explain why your answer is correct. Use words and/or pictures in your explanation.

**Day 3
Pre-assessment**

Today we will be working with various materials to construct 3-dimensional figures. Think about what you have learned the last two days to answer the following questions.

- 1. Which three-dimensional figure would need the most materials to construct the edges?**

- 2. Which three-dimensional figure would need the fewest materials to construct the edges?**

- 3. Which three-dimensional figure would need the most materials to construct the vertices?**

- 4. Which three-dimensional figure would need the least materials to construct the vertices?**

What 3-Dimensional Geometric Shape can you make with...?
BCR


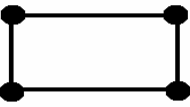
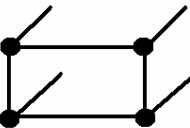
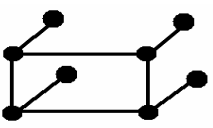
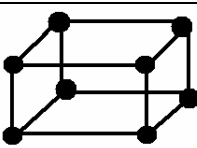
Part A

Pat has only eight toothpicks. Name two three-dimensional shapes that Pat can make and two that Pat cannot make with some or all of the toothpicks.

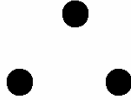
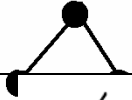


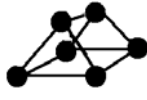
CAN	CAN NOT
1. _____	
1. _____	

Part B

Use what you know about geometric figures to explain why your answer is correct. Use words and/or pictures in your explanation.

Rectangular Prism-Student Resource 18	
Put 4 vertex materials on the desk in the shape of a rectangle.	
Use 4 edge materials to connect the 4 vertices.	
Use 4 edge materials and put one into each vertex so that they stick up.	
Use 4 vertex materials and place one on top of each edge that is sticking up.	
Use 4 edge materials to connect the 4 vertices you just added.	

Triangular Prism - Student Resource 18

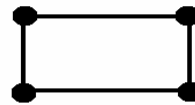
<p>Put 3 vertex materials on the desk in the shape of a triangle.</p>	
<p>Use 3 edge materials to connect the 3 vertices.</p>	
<p>Use 3 edge materials and put one into each vertex so that they stick up.</p>	
<p>Use 3 vertex materials and place one on top of each edge that is sticking up.</p>	
<p>Use 3 edge materials to connect the 3 vertices you just added.</p>	

Rectangular Pyramid - Student Resource 18

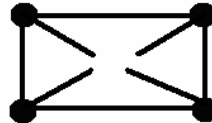
Put 4 vertex materials on the desk in the shape of a rectangle.



Use 4 edge materials to connect the 4 vertices.



Use 4 edge materials and put one into each vertex so that they stick up.

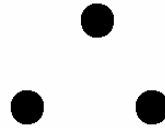


Use 1 piece of vertex material to connect the 4 edges that are sticking up.

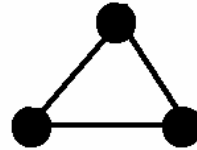


Triangular Pyramid – Student Resource 18

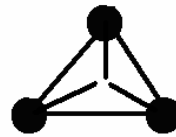
Put 3 vertex materials on the desk in the shape of a triangle.



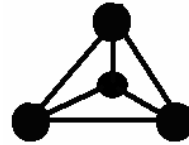
Use 3 edge materials to connect the 3 vertices.

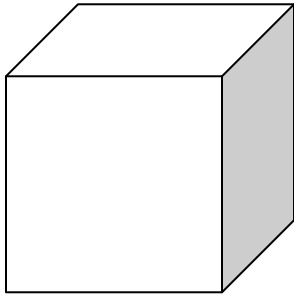


Use 3 edge materials and put one into each vertex so that they stick up.



Use 1 piece of vertex material to connect the 3 edges that are sticking up.

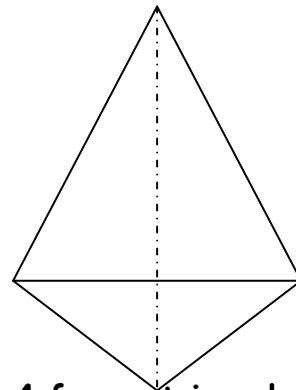




6 square faces, 8

vertices, 12 edges, right

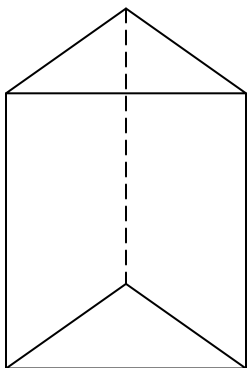
angles, rectangular prism



4 faces, triangular faces,

4 vertices, 6 edges,

triangular pyramid

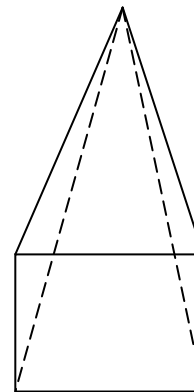


Triangular prism, 2

triangular faces, 3

rectangular faces, 5 total

faces, 6 vertices, 9 edges



Square or rectangular

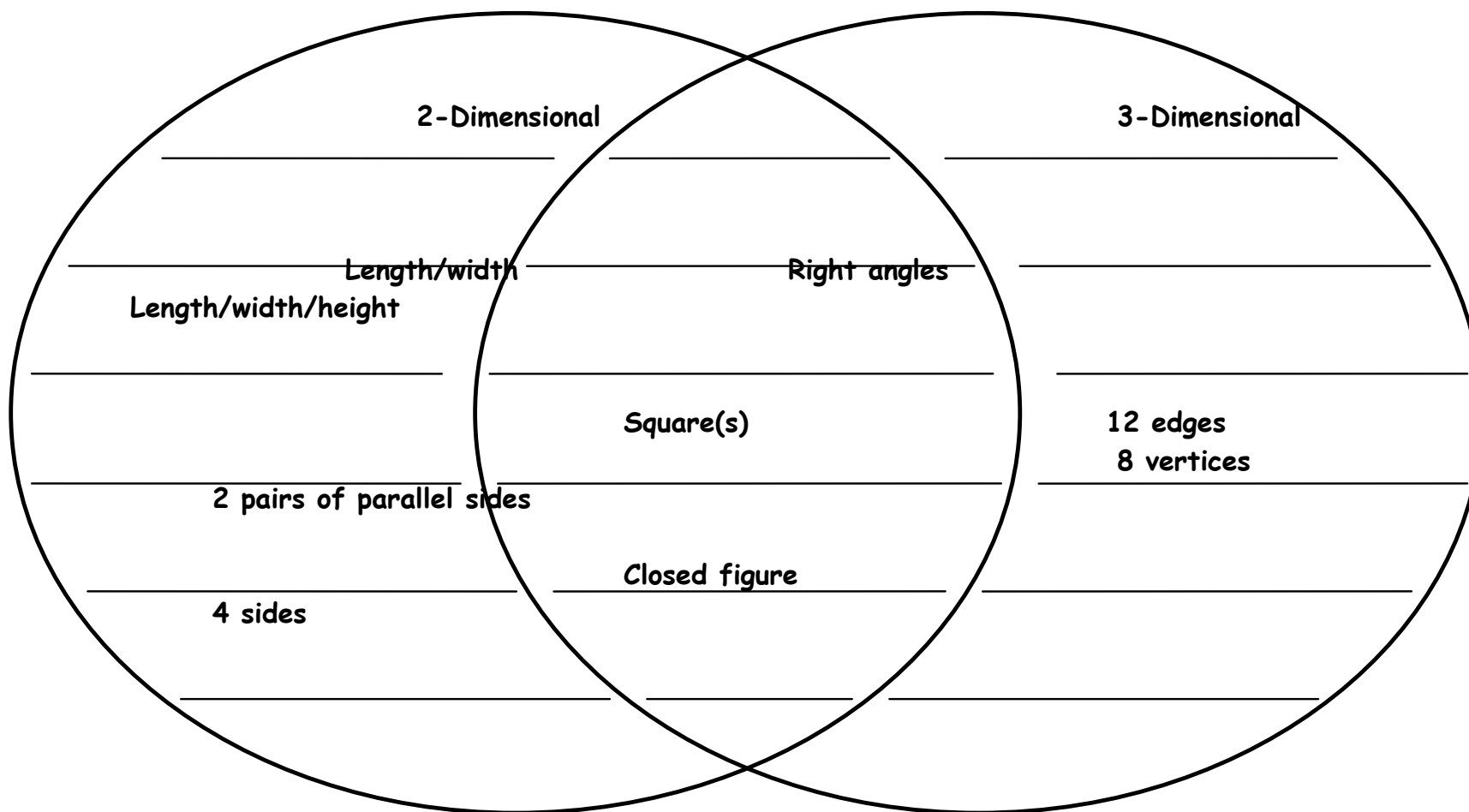
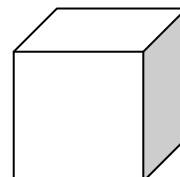
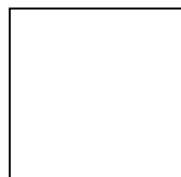
pyramid, 1 square or

rectangular face, 4

triangular faces, 8 edges,

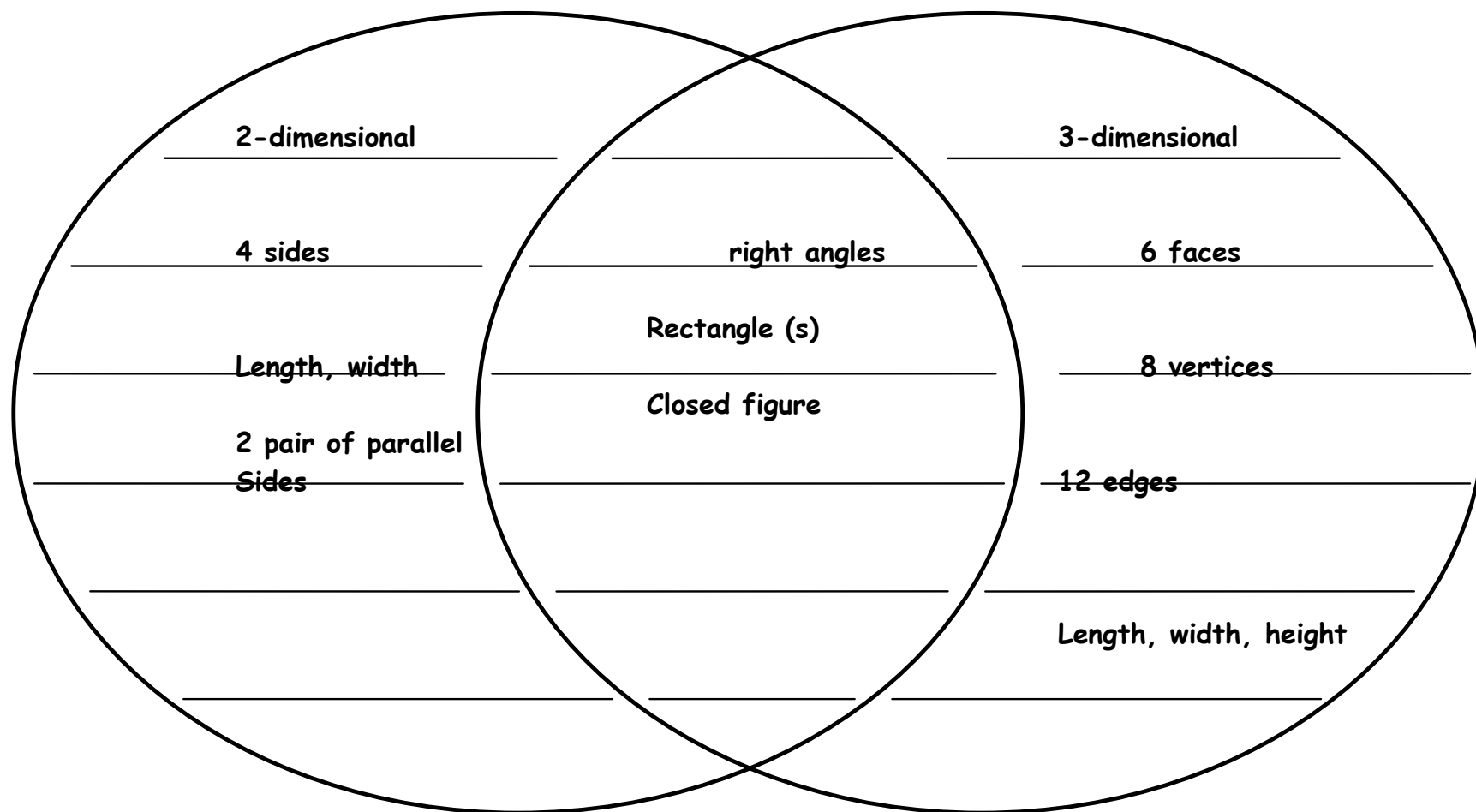
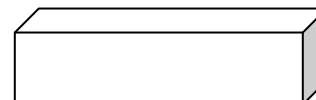
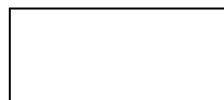
Name _____

Date _____



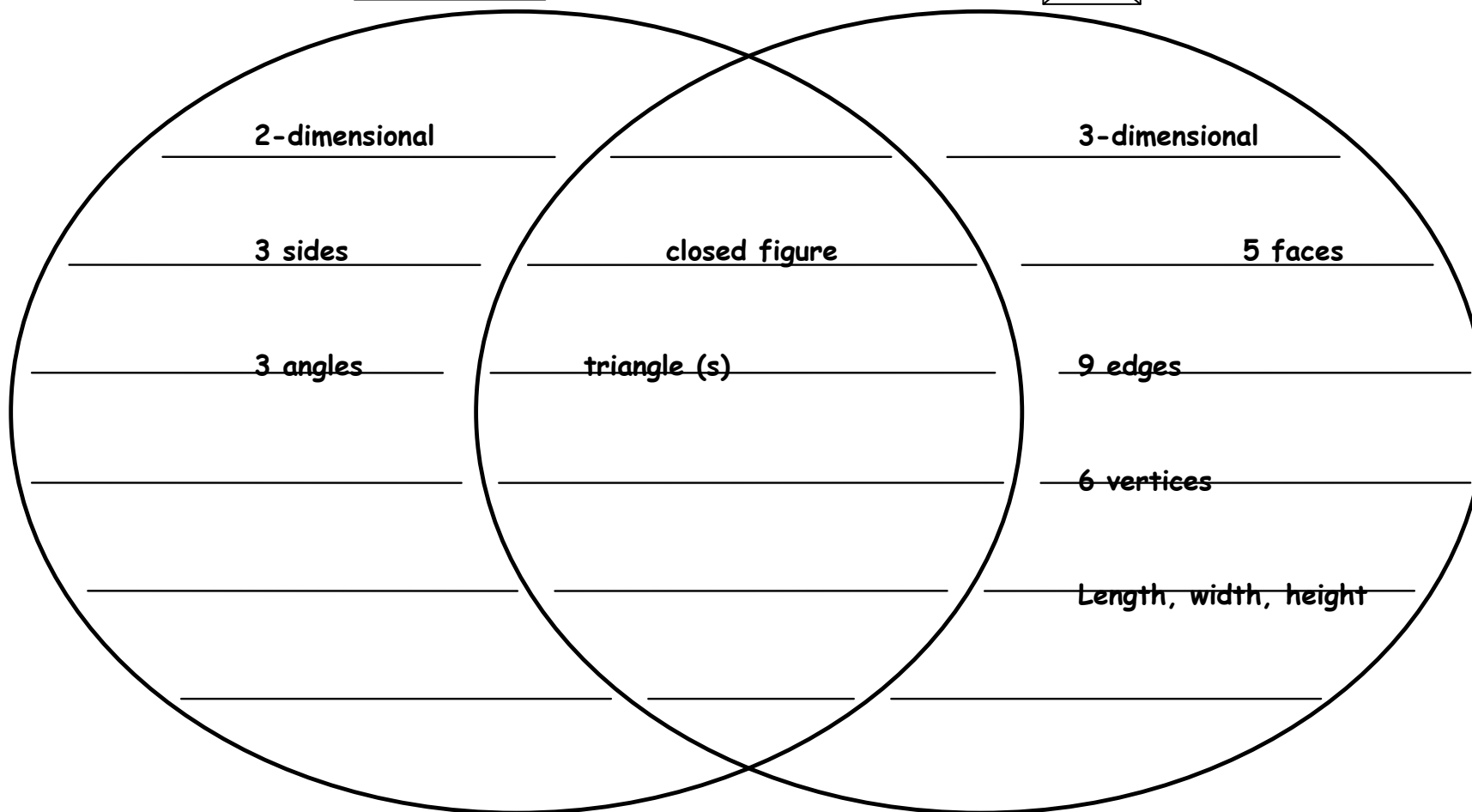
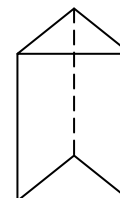
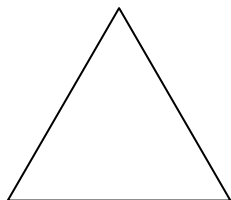
Name _____

Date _____



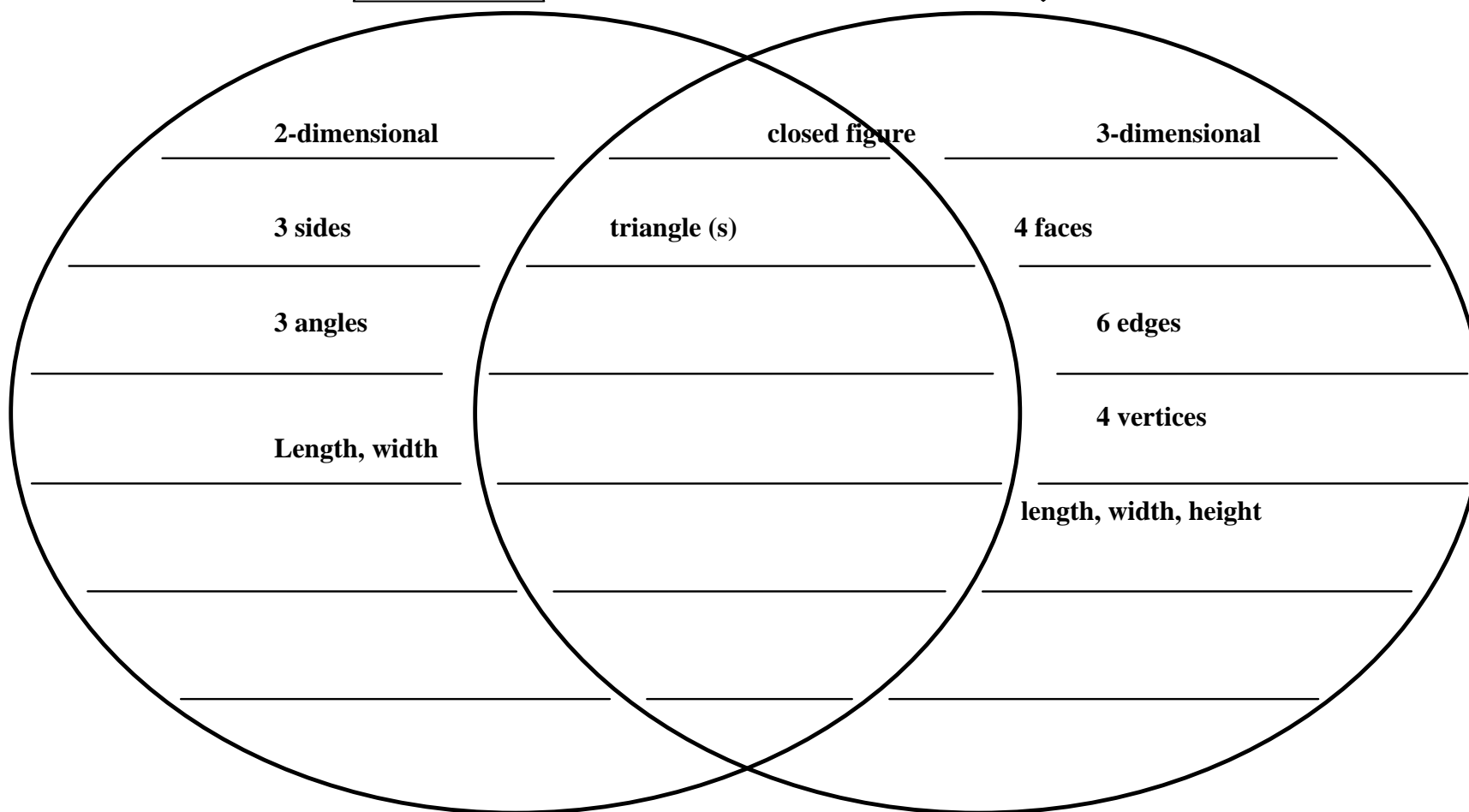
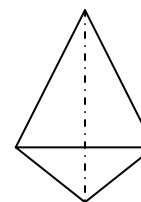
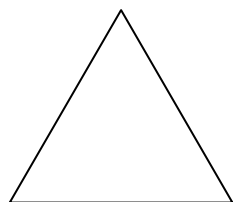
Name _____

Date _____



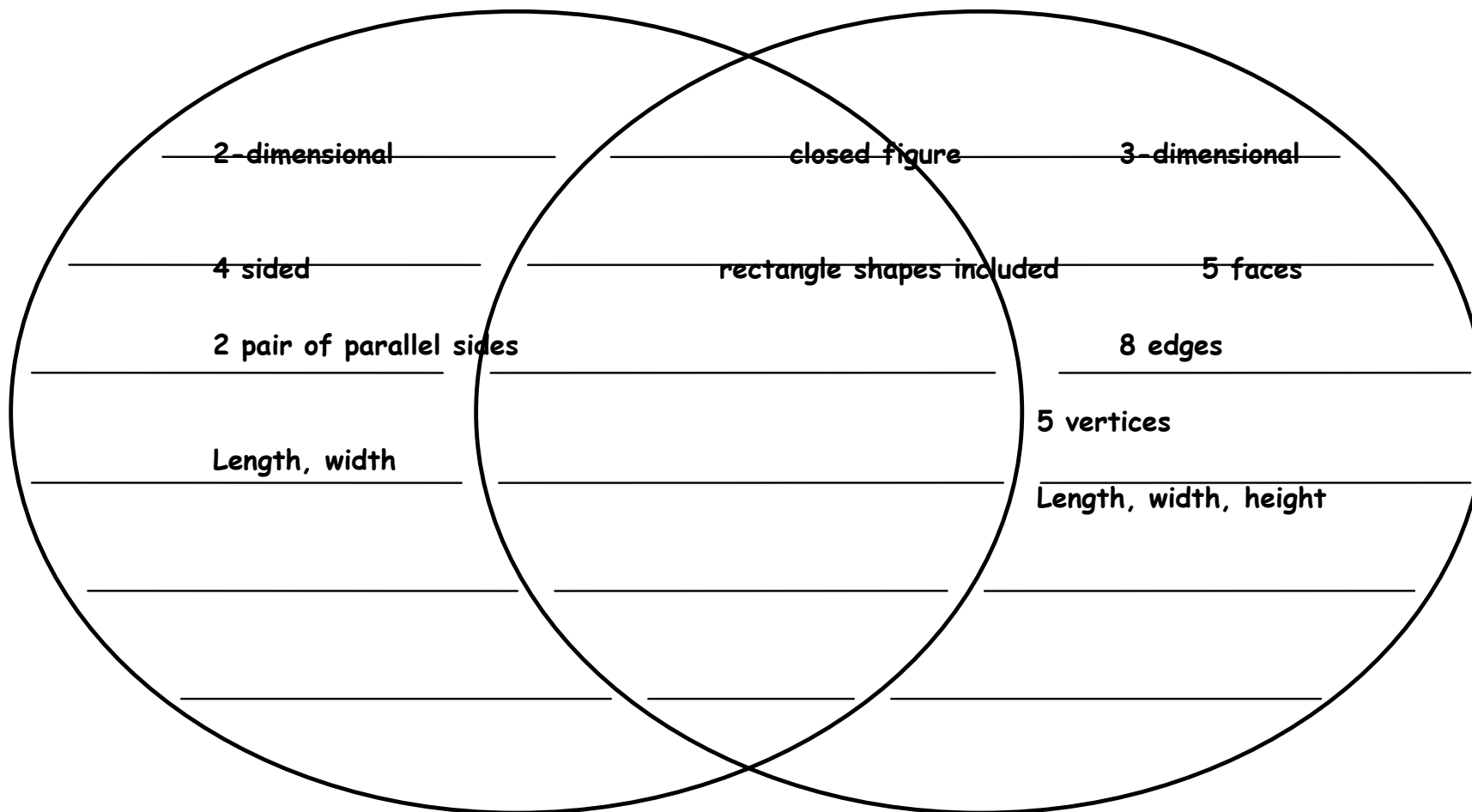
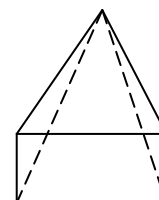
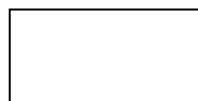
Name _____

Date _____



Name _____

Date _____



Riddles

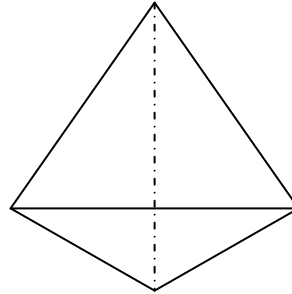
Use your knowledge of geometry to identify these figures.

5. I have four sides.

All my sides are the same length.

I have four right angles.

What am I? Square



6. I have six faces.

My faces meet at right angles.

All my faces are squares.

What am I? Cube

7. I have five faces.

All but one of my faces is a triangle

The face of the base has two pairs of parallel sides and four right angles.

What am I? Rectangular pyramid

8. I have five faces.

My base shape has three sides.

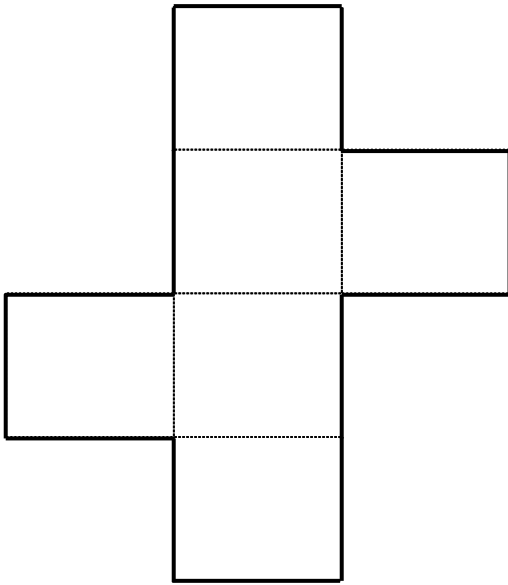
I am constructed with three rectangles.

What am I? Triangular pyramid

Net pre-assessment
Day 2

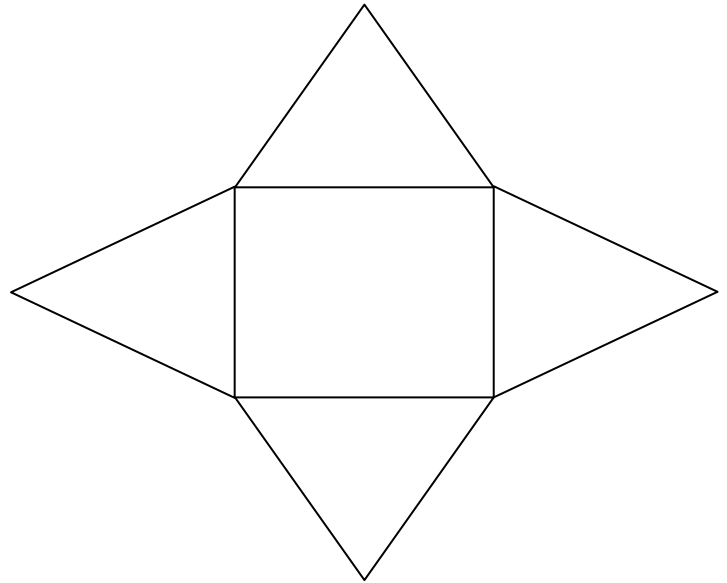
Directions: Use the following nets to name the figure.

1.



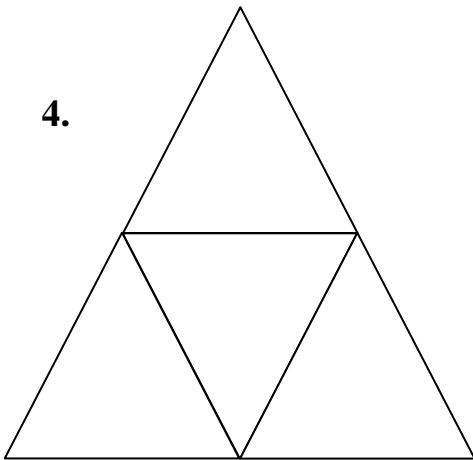
Cube

2.



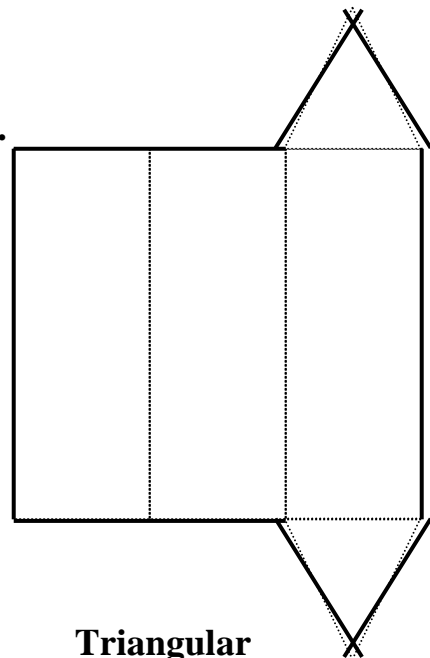
rectangular pyramid

4.



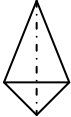
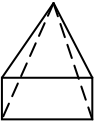
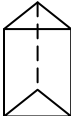
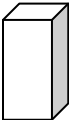
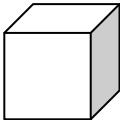
Triangular pyramid

4.



Triangular
Prism

Three-Dimensional Figures

Picture	Name	Number of Edges	Number of Faces	Number of Vertices	Real World Example(s)
	Triangular pyramid	Tetrahedron 6		4	4
	Rectangular pyramid	Egyptian 8		5	5
	Triangular prism	Toblerone 9		5	6
	Rectangular prism	box 12		6	Cereal 8
	Cube	box 12		6	Tissue

Riddle BCR

Part A

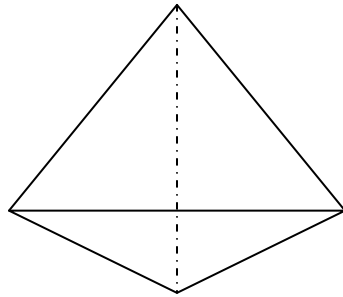
A shape has four faces. All the faces are the same shape. There are only triangular shaped faces. To put it together you tape six edges. Name this 3-dimensional shape.

Triangular Pyramid

Part B

Use what you know about geometric figures to explain why your answer is correct. Use words and/or pictures in your explanation.

I know that a triangular pyramid has four faces because the base is a triangle and there is one triangle coming off each side of that base triangle. Since there are only triangles then I know that there must be 3 edges connected at the bottom and then 3 more to connect the remaining triangles.



**Day 3
Pre-assessment**

Today we will be working with various materials to construct 3-dimensional figures. Think about the shapes and three-dimensional figures you have explored during the last two days to answer the following questions.

1. Which three-dimensional figure would need the most materials to construct the edges?

Rectangular prism or cube

2. Which three-dimensional figure would need the fewest materials to construct the edges?

Triangular pyramid

3. Which three-dimensional figure would need the most materials to construct the vertices?

Rectangular prism or cube

4. Which three-dimensional figure would need the least materials to construct the vertices?

Triangular pyramid

What 3-Dimensional Geometric Shape can you make with...?
BCR

Part A

Pat has only eight toothpicks. Name two three-dimensional shapes that Pat can make and two that Pat cannot make with some or all of the toothpicks.

CAN	CAN NOT
1. <u>square pyramid</u>	1. <u>cube</u>
2. <u>rectangular pyramid</u>	2. <u>rectangular prism</u>

Part B

Use what you know about geometric figures to explain why your answer is correct. Use words and/or pictures in your explanation.

In order for students to get full credit they would need to include what they know about the shapes they chose and how they know that eight or less straws would be enough to construct the edges necessary for those particular figures in the “can” column. They would also need to include why the figures in the “can not” column would not fit the criteria.